



**DRAFT
Delisting Decision
for
Mill Creek**

Waterbody ID AL03130003-0101-100

Organic Enrichment (CBOD, NBOD)

Alabama Department of Environmental Management
Water Division
Water Quality Branch
January 2018

Mill Creek Watershed Map in the Chattahoochee River Basin

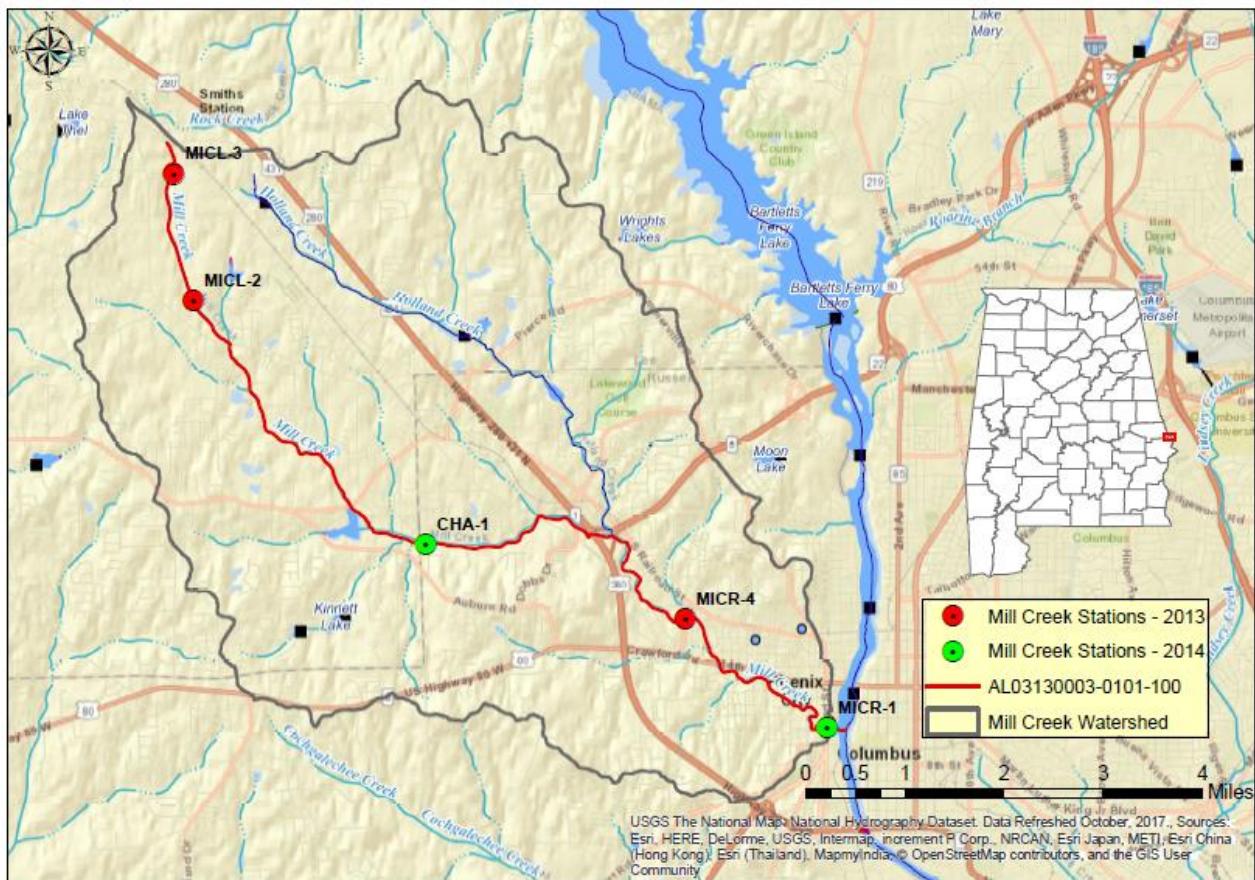


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1.0 Executive Summary

Mill Creek, located in Lee and Russell counties, is a part of the Chattahoochee River Basin. Mill Creek originates south of the community of Smiths Station and flows approximately 9.93 miles before draining into the Chattahoochee River. In 2006, ADEM placed Mill Creek on the §303(d) list, with the cause and source both listed as unknown. In 2010, the list was updated to reflect organic enrichment (CBOD, NBOD) as the impairment, with the source being urban development. This was based off of 1999 and 2008 data. According to the 2010 §303(d) Fact Sheet, 5 out of 8 dissolved oxygen values at ADEM station CHA-1 were lower than the criteria in 2008. The source was changed to urban development based on land use patterns around the monitored area.

Over the last six years, additional data has been acquired for Mill Creek to assess its ability to meet applicable water quality standards. The data indicates that Mill Creek, from its mouth to its source, now fully supports its use classification with respect to organic enrichment. Based on the assessment of the available data, ADEM has determined that a water quality impairment due to organic enrichment does not currently exist. Low dissolved oxygen concentrations are due to the naturally occurring conditions in the watershed, which will be further explained below. Therefore, ADEM will not develop a TMDL due to “more recent or accurate data,” which is just cause for delisting a waterbody according to Title 40 of the Code of Federal Regulations (CFR), Part 130.7(b)(6)(iv).

2.0 Basis for §303(d) Listing

Section 303(d) of the Clean Water Act (CWA), as amended by the Water Quality Act of 1987 and EPA’s Water Quality Planning and Management Regulations [Title 40 of the Code of Federal Regulations (CFR), Part 130], requires states to identify waterbodies which are not meeting water quality standards applicable to their designated use classifications. The identified waters are prioritized based on severity of pollution with respect to designated use classifications. TMDLs for all pollutants causing violation of applicable water quality standards are established for each identified waterbody. Such loads are established at levels necessary to attain the applicable water quality standards when also considering seasonal variations and margins of safety. The TMDL process establishes the allowable loading of pollutants, or other quantifiable parameters for a waterbody, based on the relationship between pollution sources and in-stream water quality conditions, so that states can establish water-quality based controls to reduce pollution from both point and non-point sources and restore and maintain the quality of their water resources (USEPA, 1991).

In 2006, ADEM placed Mill Creek on the §303(d) list, with the cause and source both listed as unknown. In 2010, the list was updated to reflect organic enrichment (CBOD, NBOD) as the impairment, with the source being urban development. This was based off of 1999 and 2008 data. According to the 2010 §303(d) Fact Sheet, 5 out of 8 dissolved oxygen values at ADEM station CHA-1 were lower than the criteria in 2008. The source was changed to urban development based on land use patterns around the monitored area.

3.0 Technical Basis for Delisting Decision

3.1 Water Quality Target Identification

The use classification for Mill Creek is Fish and Wildlife. According to ADEM's Water Quality Criteria (Administrative Code 335-6-10), the Dissolved Oxygen criterion for the Fish and Wildlife use classification is as follows:

For a diversified warm water biota, including game fish, daily dissolved oxygen concentrations shall not be less than 5 mg/l at all times; except under extreme conditions due to natural causes, it may range between 5 mg/l and 4 mg/l, provided that the water quality is favorable in all other parameters. The normal seasonal and daily fluctuations shall be maintained above these levels.

In order to determine if an organic enrichment impairment exists in Mill Creek, the Department will focus on the dissolved oxygen concentrations along with some of the primary drivers affecting instream dissolved oxygen concentrations, including carbonaceous biochemical oxygen demand (CBOD) and nitrogenous biochemical oxygen demand (NBOD).

ADEM recently published updated ecoregional reference guidelines for a number of parameters and pollutants. Reference streams, also referred to as "reference reaches" or "ecoregional reference sites," are defined as relatively homogeneous areas of similar climate, land form, soil, natural vegetation, hydrology, and other ecologically relevant variables (USEPA, 2000b) which have remained comparatively undisturbed or minimally impacted by human activity over an extended period of time in relation to other waters of the State. While not necessarily pristine or completely undisturbed by humans, reference streams do represent desirable chemical, physical and biological conditions for a given ecoregion that can be used for evaluation purposes.

The reference streams selected for a particular analysis depends primarily on the number of available reference stations and associated data within a particular ecoregion. Therefore, the total number of reference sites selected and the aerial scale (i.e. Ecoregion Level III, Level IV) used to represent a reference condition will often vary on a case-by-case basis.

The 90th percentile of the data distributions from the selected eco-region reference sites will be used in establishing CBOD and NBOD evaluation concentrations that will serve as values for comparison to the recently collected ambient water quality data. The entire Mill Creek watershed is located within the Level IV Ecoregion 65i. The 90th percentile of the CBOD5, ammonia nitrogen, and total Kjeldahl nitrogen data distributions collected from this eco-region are 2.1 mg/l, 0.0663 mg/l and 0.535 mg/l, respectively. Ambient water quality data will be evaluated against these eco-reference concentrations to determine if an organic enrichment impairment exists in Mill Creek.

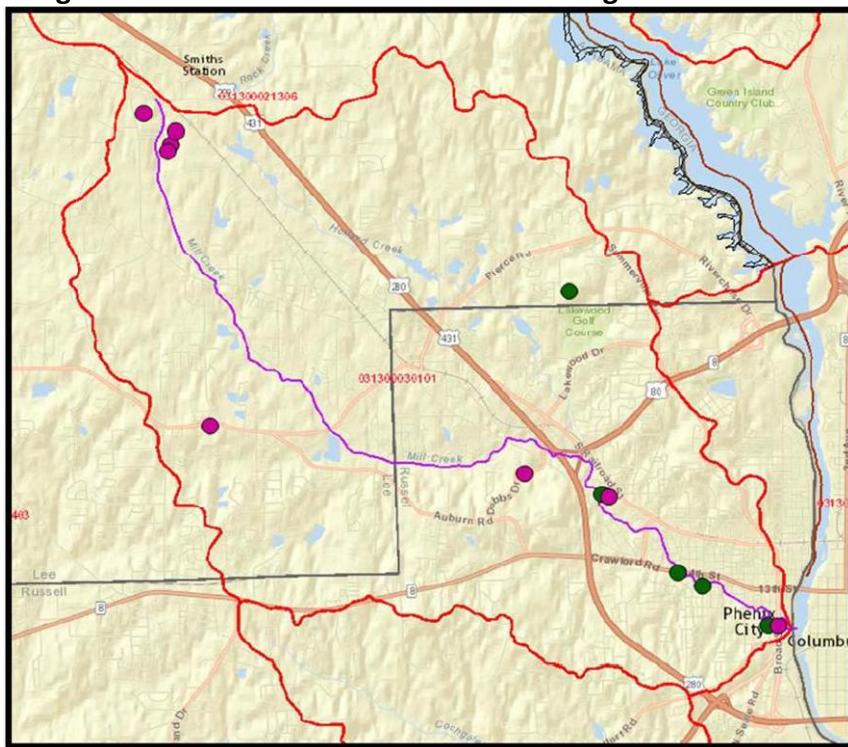
3.2 Data Availability and Analysis

In 2010, ADEM worked with various local private and public entities to compile information for the Mill Creek Watershed Management Plan. The goal of the plan was to effectively summarize stakeholder inputs and to suggest reasonable implementation practices that are scientifically supported and economically effective to improve the health and habitat of Mill Creek. The objective of this plan was to address impairments to the creek through on-the-ground BMPs and education.

The Mill Creek Watershed Management Plan was implemented in part using a Clean Water Act §319(h) nonpoint source grant provided by the USEPA through the ADEM Nonpoint Source Program. Federal, state, and local agencies, as well as local landowners, partnered to implement watershed conservation practices and restoration initiatives. Beginning in 2011, Phase I included various storm water best management practices (BMPs) that were installed in the Mill Creek watershed including bio-retention cells, rain gardens, vegetated swales, constructed storm water wetlands, stream restoration, and a septic tank pump-out program. In addition, education/outreach activities include presentations at local schools and public meetings for landowners. The Phase I process ended in 2013 with the immediate beginning of Phase II.

Phase II of the watershed management plan aimed at accelerating the removal of the waterbody from the §303(d) list and reducing excessive NPS pollutant loadings to the waterbody (CBOD and NBOD). This was achieved by identifying high-yielding pollution sites, partnering with local landowners to install BMPs to control NPS runoff, and providing education and outreach to the surrounding community. The Phase II project was officially completed in August of 2016, with most of the “on the ground” BMPs completed in late 2013. Figure 3.1 below provides an illustration of where the BMPs were implemented in the Mill Creek Watershed from 2011 to 2016. Phase I is identified by pink markings and Phase II is identified by the green markings.

Figure 3.1 Mill Creek Watershed Best Management Practices



It should be noted that even though Mill Creek was sampled in 2008 and 2013, only the data that is approximately six years in age or less and has a full dataset was used in this analysis, which is consistent with *Alabama's Water Quality Assessment and Listing Methodology* (ADEM, 2016). In 2013, Mill Creek was sampled at MICL-3, MICL-2, and MICR-4. These stations are represented by only 4 months of data; however, all of the dissolved oxygen samples were above the criterion of 5 mg/l. This data provides additional insight and supplemental information for the rest of Mill Creek not already represented by stations CHA-1 and MICR-1. Refer to Table 3.1 for a list of the 2013 Mill Creek Sampling Stations and Appendix A for the data from these stations.

Table 3.1 Mill Creek 2013 Sampling Stations

Station	Latitude	Longitude	Description
MICL-3	32.53367	-85.0959	Mill Cr at Lee Co Rd 728
MICL-2	32.51806	-85.0931	Mill Cr behind Philadelphia Baptist Church on Lee Co Rd 246
MICR-4	32.4789	-85.0214	Mill Cr @ 20th Ave in Phenix City

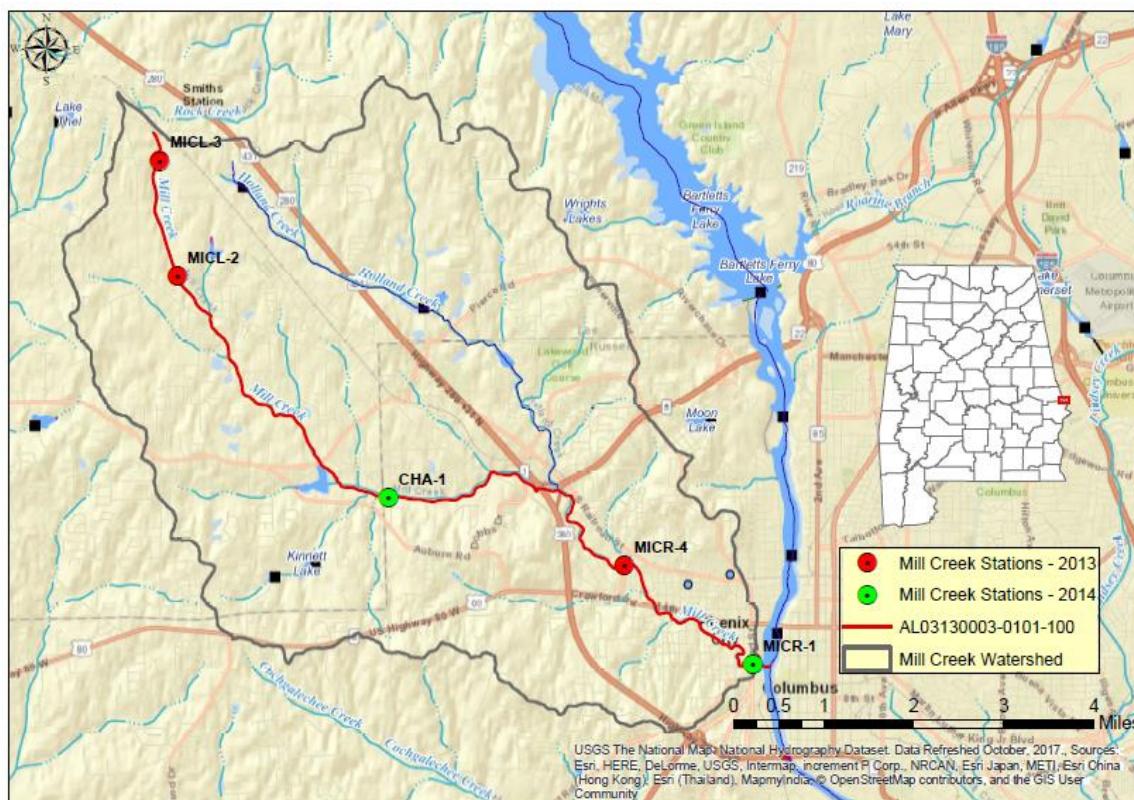
The Department believes that focusing on the recent water quality data collected in 2014 provides a better evaluation of the present water quality conditions of Mill Creek following the implementation of the numerous storm water best management practices in the watershed during 2011 to 2016. Therefore, the data that was utilized to evaluate if Mill Creek is now fully supporting its use classification with respect to organic enrichment is from

ADEM's 2014 sampling efforts and the September 2014 72-hour study. Both sampling efforts were focused around stations CHA-1 and MICR-1. Refer to Table 3.2 for location descriptions of all the aforementioned sampling stations and to Figure 3.2 for a map depicting the locations of the 2014 Mill Creek sampling stations.

Table 3.2 Mill Creek 2014 Sampling Stations

Station	Latitude	Longitude	Description
CHA-1	32.48806	-85.05917	Mill Creek at Poyner Road in (SW/SW ¼)
MICR-1	32.4656	-85.000778	Mill Creek at Broad Street in Phenix City

Figure 3.2 Map of 2013-2014 Sampling Locations for Mill Creek



Organic Enrichment (CBOD & NBOD) Data Analysis

In Table 3.3, the CBOD and NBOD data collected from Mill Creek during the 2014 sampling efforts are compared to the eco-reference CBOD and NBOD concentrations. Based on the lab results, all of the collected CBOD5 concentrations were below the Department's method detection limit of 2 mg/l. Therefore, based on Departmental protocol, one-half of the method detection limit concentration will be used in the data analysis. Since all of the collected samples were below the method detection limit, the median CBOD5 concentrations collected from Mill Creek during the 2014 sampling efforts are presumed to be less than the eco-reference value.

In order to assess the oxygen demand associated with the oxidation of ammonia to nitrate, the Department considered the observed ammonia and total Kjeldahl nitrogen (TKN) concentrations collected from Mill Creek during the 2014 sampling efforts. Total Kjeldahl nitrogen is the summation of the organically bound nitrogen and ammonia nitrogen in water, and can be used as a surrogate to evaluate the NBOD demand. The results indicate the median ammonia and total Kjeldahl nitrogen (TKN) concentrations are considerably less than the eco-reference values at MICR-1. At CHA-1, the median TKN concentrations are slightly elevated when compared to the eco-reference value, but the median ammonia nitrogen is considerably less than the eco-reference value. Because CHA-1 is located in a poorly draining floodplain, this station is expected to have higher levels of total nitrogen due to natural conditions.

Table 3.3 Mill Creek 2014 – Organic Enrichment Data Analysis**MICR-1 2014 Results**

Parameter	N	Min	Max	Med	Avg	SD	10th % ile	90th % ile	Eco-Reference (65i)
Dissolved Oxygen (mg/l)	9	6.8000	10.4700	8.9100	8.9311	1.0100	8.0560	9.9020	6.6500 ^a
Ammonia Nitrogen (mg/l)	8	0.0060	0.1680	0.0060	0.0273	0.0569	0.0060	0.0574	0.0663 ^b
Total Kjeldahl Nitrogen (mg/l)	8	0.2520	1.6200	0.5320	0.6374	0.4273	0.3290	1.0215	0.5350 ^b
CBOD-5 (mg/l)	8	2.0000	2.0000	1.0000	1.0000	0.0000	1.0000	1.0000	2.1000 ^b

a. 10th Percentileb. 90th Percentile**CHA-1 2014 Results**

Parameter	N	Min	Max	Med	Avg	SD	10th % ile	90th % ile	Eco-Reference (65i)
Dissolved Oxygen (mg/l)	7	2.9300	9.3300	6.4800	6.2657	1.9915	4.1780	8.2320	6.6500 ^a
Ammonia Nitrogen (mg/l)	7	0.0200	0.1830	0.0480	0.0653	0.0536	0.0326	0.1116	0.0663 ^b
Total Kjeldahl Nitrogen (mg/l)	7	0.5380	0.7190	0.6890	0.6513	0.0724	0.5602	0.7184	0.5350 ^b
CBOD-5 (mg/l)	7	2.0000	2.0000	1.0000	1.0000	0.0000	1.0000	1.0000	2.1000 ^b

10th Percentileb. 90th Percentile

None of the nine dissolved oxygen samples collected on Mill Creek at station MICR-1 during the 2014 sampling effort were below the Fish and Wildlife use classification DO criterion of 5 mg/l. Of the seven dissolved oxygen samples collected on Mill Creek at station CHA-1 during the 2014 sampling effort, one individual sample was below the Fish and Wildlife use classification DO criterion of 5 mg/l. It should be noted that the flow recorded on the day of the low DO value was 0.2473 cfs. Observations from the watershed management plan technical committee (MCWMP 2010) suggest that Mill Creek has low DO values at station CHA-1 due to a combination of drought, surrounding soil type, and beaver dams. ADEM Station CHA-1 is located on floodplain soil that is poorly drained and frequently flooded (NRCS 2006). Floodplain soils generally have lower oxygen concentrations due to soil pores being filled with water rather than air. Particle size, wetland suitability, and wetland vegetation present strongly indicate past and present wetland conditions in this area. Refer to the aerial view of CHA-1 and the surrounding area in Figure 3.3.

Figure 3.3 Aerial View of Station CHA-1



A 72-hour study was also conducted in September 2014 at stations CHA-1 and MICR-1. Refer to Appendix D for the study data. Graphs of the 72-hour DO data are shown in Figures 3.4 and 3.5. DO values at MICR-1 remained above 5 mg/l during the entire study. While the DO values were below 5 mg/l at CHA-1 for much of the study, it should be noted that the flows recorded during the study were very low, as seen in Table 3.4. CHA-1 and MICR-1 station visit pictures from the 2014 sampling can be found in Appendix E.

Figure 3.4 Station CHA-1 72- Hour Study – Dissolved Oxygen

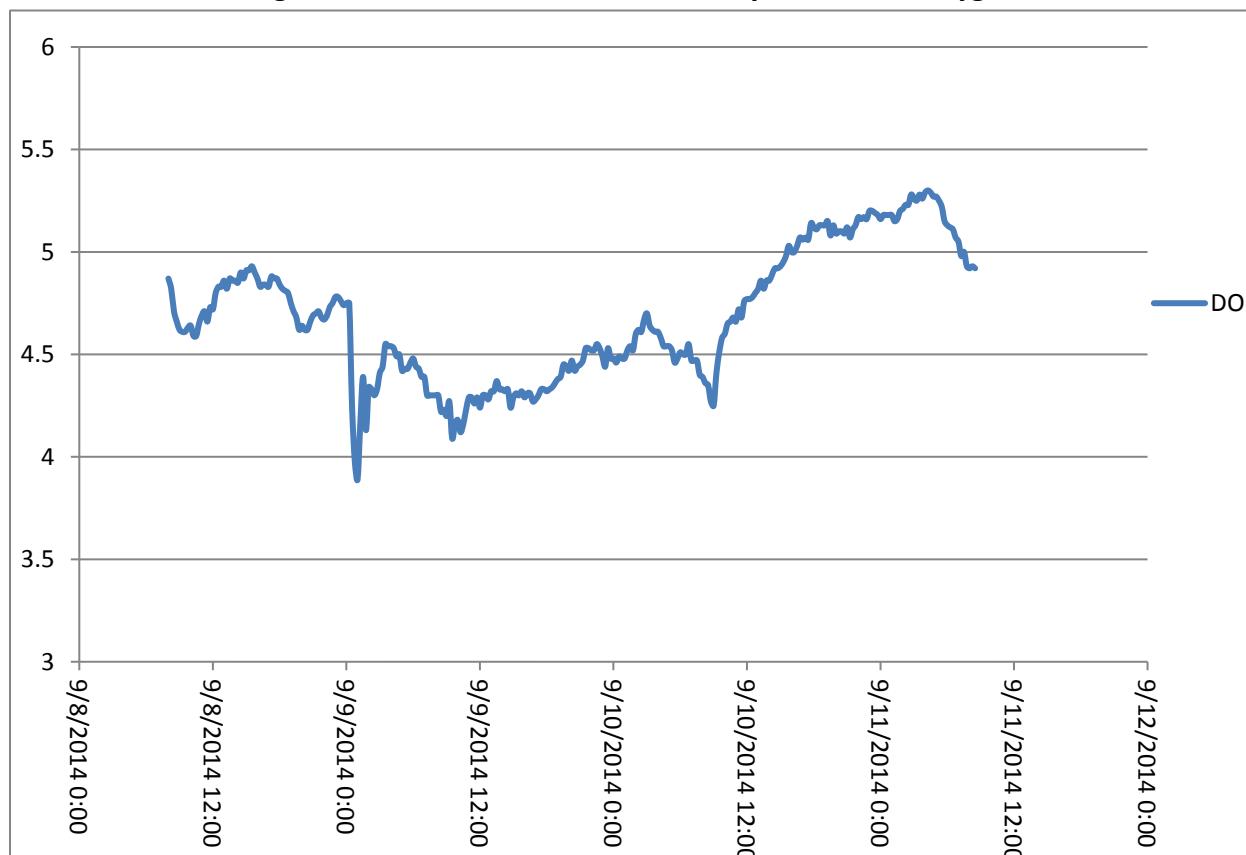


Figure 3.5 Station MICR-1 72-Hour Study – Dissolved Oxygen

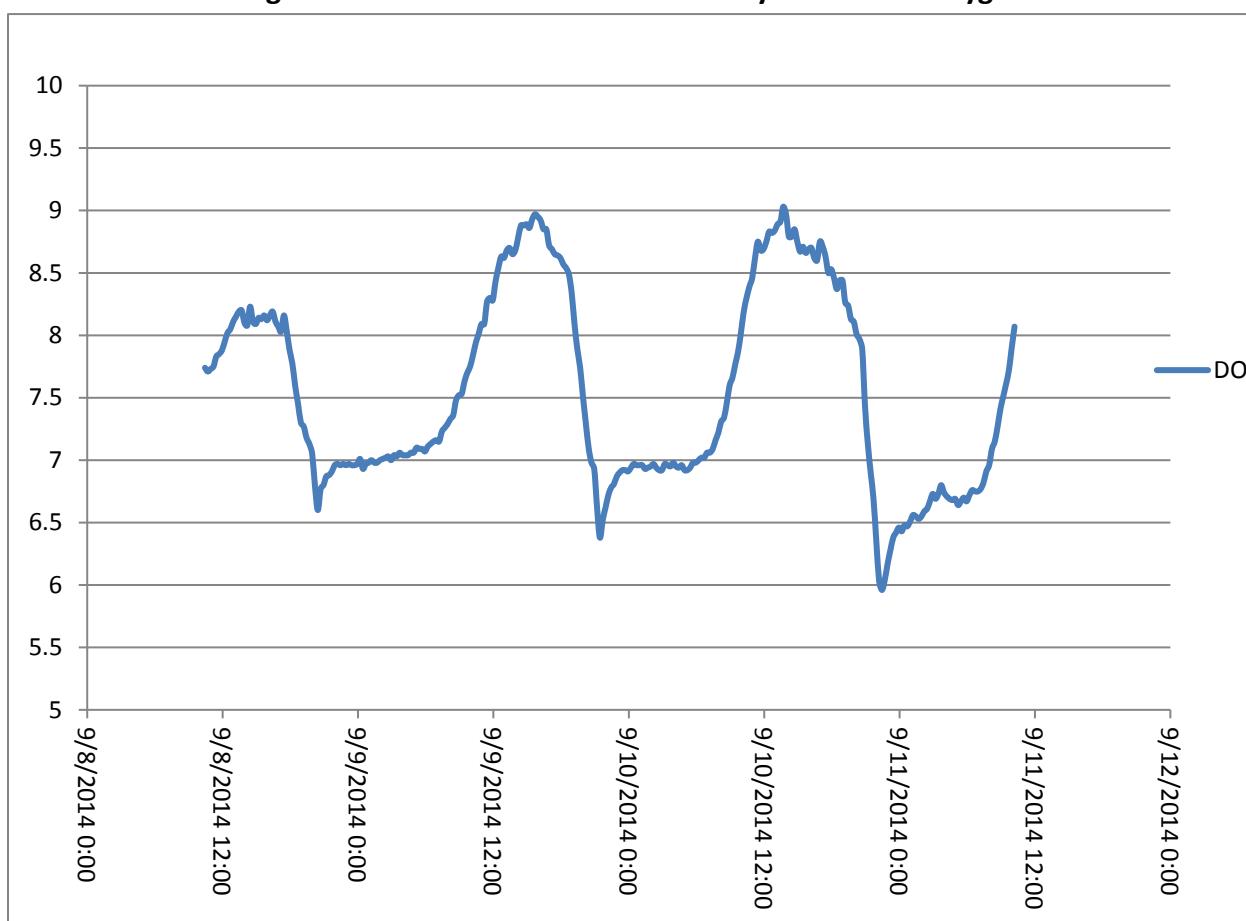


Table 3.4 September 2014 72-Hour Study – Total Discharge

Station	Date	Time	Total Discharge (m ³ /s)
CHA-1	9/8/2014	7:57 AM	0.0045
CHA-1	9/9/2014	7:32 AM	0.0062
CHA-1	9/10/2014	9:06 AM	0.0073
CHA-1	9/11/2014	8:38 AM	0.0057
MICR-1	9/8/2014	10:37 AM	0.1077
MICR-1	9/9/2014	8:56 AM	0.0647
MICR-1	9/10/2014	10:28 AM	0.0606
MICR-1	9/11/2014	10:03 AM	0.0541

Furthermore, Mill Creek stakeholders identified beaver dams as potentially contributing to low dissolved oxygen levels. Watershed visits to ADEM sampling location CHA-1 indicated the presence of beavers based on the presence of dams, ponds, and adjacent stripped trees (MCWMP 2010). Beaver dams have sequestered portions of Mill Creek creating stagnant pools with very limited flow. Waters with restricted movement often have high BOD with low dissolved oxygen levels. Beaver dams are present at CHA-1 and impact both flow patterns and DO. Refer to Figure 3.6 for a picture of a beaver dam taken upstream of station CHA-1.

Figure 3.6 Beaver Dam on Mill Creek



The citizen-based volunteer group Alabama Water Watch also collected monthly samples at multiple locations on Mill Creek between 2013 and 2016. Although this data will not be used solely to make an evaluation as to whether Mill Creek is fully supporting its use classification with respect to organic enrichment, the Alabama Water Watch data provides additional insight and supplemental information to the available data from the Department's 2014 sampling efforts. During the Department's 2014 station visits to Mill Creek, the minimum dissolved oxygen concentration observed was 2.93 mg/l at CHA-1. However, the available data from Alabama Water Watch indicates during periods of adequate stream flow in Mill Creek, the minimum observed dissolved oxygen concentrations remain well above the DO criteria of 5 mg/l during the winter and spring months. Please see Appendix C for further information regarding the Alabama Water Watch Mill Creek 2013-2016 sampling locations and water quality data. See Table 3.5 for the corresponding Alabama Water Watch and ADEM Sampling Stations.

Table 3.5 Mill Creek Alabama Water Watch Sampling Stations

AWW Site Code	Latitude	Longitude	ADEM Station	Site Description
3015003	32.533611	-85.095861	MICL-3	MC 39 at Lee Rd 728
3015007	32.517782	-85.093184	MICL-2	Behind Philadelphia Baptist Church
3015002	32.487622	-85.058942	CHA-1	at Poyner Drive and Poyner Court
3017002	32.478877	-85.021402	MICR-4	20th Avenue Bridge-upstream side
3015013	32.465736	-85.002195	MICR-1	Upstream of Bridge at Broad Street

Based upon this information, the Department believes the low dissolved oxygen concentrations in Mill Creek are not a result of an organic enrichment impairment but are attributable to low flows, surrounding soil type, and beaver dams in Mill Creek during the summer months.

4.0 Conclusion

Based on an examination of the recently collected water quality data on Mill Creek in 2014 following the implementation of numerous best management practices in the watershed from 2011 to 2016, ADEM has determined that a water quality impairment due to organic enrichment does not currently exist. The Department believes that Mill Creek is currently fully supporting its use classification with respect to organic enrichment. Therefore, ADEM will not develop a TMDL due to “more recent data,” which is a just cause for delisting waterbodies according to Title 40 of the Code of Federal Regulations (CFR), Part 130.7(b)(6)(iv).

5.0 Public Participation

As part of the public participation process, this Delisting Decision (DD) will be placed on public notice and made available for review and comment. The public notice will be prepared and published in the major daily newspapers in Montgomery, Huntsville, Birmingham, and Mobile, as well as submitted to persons who have requested to be on ADEM’s postal and electronic mailing distributions. In addition, the public notice and subject DD will be made available on ADEM’s Website: www.adem.state.al.us. The public can also request paper or electronic copies of the DD by contacting Ms. Kimberly Minton at 334-271-7826 or kminton@adem.alabama.gov. The public will be given an opportunity to review the DD and submit comments to the Department in writing. At the end of the public review period, all written comments received during the public notice period will become part of the administrative record. ADEM will consider all comments received by the public prior to finalization of this DD and subsequent submission to EPA Region 4 for final review and approval.

Appendix A References

ADEM Administrative Code, 2016. Water Quality Program, Chapter 335-6-10, Water Quality Criteria, and Chapter 335-6-11 Use Classifications for Interstate and Intrastate Waters.

ADEM. 1989. *Alabama Nonpoint Source Assessment Report*. Alabama Department of Environmental Management, Montgomery, Alabama. 64pp.

ADEM. 2012. *Mill Creek Watershed Management Plan*. Alabama Department of Environmental Management, Montgomery, Alabama. http://www.aces.edu/natural-resources/water-resources/watershed-planning/watershed-projects/millcreek/documents/MCWMP_Final_12.17.10_reduced_size.pdf

ADEM 2016. *Alabama's Water Quality Assessment and Listing Methodology*

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey, 2006. Retrieved from Web Soil Survey website on March 23, 2010. <http://websoilsurvey.nrcs.usda.gov>. USDA-NRCS, Lincoln, NE.

USEPA. 1991. Guidance for Water Quality-Based Decisions: The TMDL Process, Office of Water, EPA 440/4-91-001.

Appendix B

Water Quality Data

Mill Creek 2013 Sampling - Physical Data

Station ID	Visit Date and Time	Flow cfs	T H2O C	DO mgL	Cond μmhos	pH su	Turb NTU
MICL-2	4/2/2013 12:56		16.33	9.41	68.2	6.96	7.61
MICL-2	6/4/2013 12:09	0.2913	22.61	6.82	116.5	7.22	4.99
MICL-2	8/5/2013 11:22		23.76	7.44	128.9	7.26	4.89
MICL-2	10/8/2013 11:00		18.79	7.84	126.9	7.31	2.9
MICL-3	4/2/2013 11:19		15.11	8.68	89	7.31	11.1
MICL-3	6/4/2013 12:45		22	6.59	104.2	6.82	9.9
MICL-3	8/5/2013 11:44		23.98	7.02	90.6	6.8	8.62
MICL-3	10/8/2013 11:26		18.64	6.39	98.7	6.83	3.01
MICR-4	4/2/2013 11:59	33.2888	17.37	9.76	69.8	7.29	14.5
MICR-4	6/4/2013 10:57	9.5013	24.39	7.96	94.2	7.3	53.8
MICR-4	8/5/2013 10:22	9.1275	25.3	8.15	97.7	7.24	10.9
MICR-4	10/8/2013 10:15	3.556	19.75	8.28	100.8	7.26	25.9

Mill Creek 2013 Sampling - Chemical Data

Station ID	Visit Date and Time	TDS mgL	TSS mgL	Alk Tot mgL	Alk Tot dc	NH3 mgL	NH3 dc	CBOD-5 mgL	CBOD-5 dc
MICL-2	4/2/2013 12:56	56	6	17.5		0.016	JI	2	< MDL 2
MICL-2	6/4/2013 12:09	74	1	48.7		0.016	JI	2	< MDL 2
MICL-2	8/5/2013 11:22	72	1	48.3		0.018	< MDL .018	2	< MDL 2
MICL-2	10/8/2013 11:00	73	5	52.6		0.018	< MDL .018	2	< MDL 2
MICL-3	4/2/2013 11:19	64	6	14.7		0.115		2	< MDL 2
MICL-3	6/4/2013 12:45	42	1	31.7		0.083		2	< MDL 2
MICL-3	8/5/2013 11:44	63	1	27.7		0.098		2	< MDL 2
MICL-3	10/8/2013 11:26	35	9	30.4		0.035		2	< MDL 2
MICR-4	4/2/2013 11:59	50	6	14.7		0.008	< MDL .008	2	< MDL 2
MICR-4	6/4/2013 10:57	66	7	28.7		0.069		2	< MDL 2
MICR-4	8/5/2013 10:22	63	1	30.2		0.018	< MDL .018	2	< MDL 2
MICR-4	10/8/2013 10:15	68	7	31.5		0.019	JI	2	< MDL 2

Station ID	Visit Date and Time	NO2+NO3 mgL	NO2+NO3 dc	TKN mgL	TKN dc	DRP mgL	DRP dc	Total P mgL	Total P dc
MICL-2	4/2/2013 12:56	0.314		0.314		0.004	JI	0.014	
MICL-2	6/4/2013 12:09	0.553		0.235		0.007	JI	0.017	
MICL-2	8/5/2013 11:22	0.842		0.493		0.005	JI	0.011	
MICL-2	10/8/2013 11:00	0.26		0.065	JI	0.005	JI	0.009	JI
MICL-3	4/2/2013 11:19	0.551		0.348		0.004	JI	0.015	
MICL-3	6/4/2013 12:45	0.559		0.325		0.005	JI	0.02	
MICL-3	8/5/2013 11:44	0.45		0.77		0.005	JI	0.048	
MICL-3	10/8/2013 11:26	0.724		0.075	JI	0.005	JI	0.01	
						< MDL .004			
MICR-4	4/2/2013 11:59	0.11		0.407		0.004		0.022	
MICR-4	6/4/2013 10:57	0.138		0.391		0.006	JI	0.035	
MICR-4	8/5/2013 10:22	0.156		0.55		0.005	JI	0.021	
MICR-4	10/8/2013 10:15	0.149		0.242		0.007	JI	0.049	

Mill Creek 2014 Sampling - Physical Data

Station ID	Visit Date and Time	Flow cfs	H2O C	DO mgL	Cond μmhos	pH su	Turb NTU
CHA-1	3/25/2014 11:15	12.1296	14.17	9.33	70	6.73	18.8
CHA-1	5/15/2014 12:19		19.85	7.5	61.4	6.66	45.4
CHA-1	5/21/2014 10:29		20.37	6.56	76.2	6.56	28.7
CHA-1	6/10/2014 11:36	1.3352	24.14	6.05	93.7	6.54	38.1
CHA-1	7/15/2014 14:26	0.2574					34.4
CHA-1	8/12/2014 12:57	0.4664	25.68	5.01	61.5	6.28	47.9
CHA-1	9/16/2014 12:06	0.2473	24.87	2.93	87.9	6.17	32.2
CHA-1	10/20/2014 11:35	1.4007	15.94	6.48	74.2	6.16	79.2
MICR-1	3/25/2014 9:37		13.75	10.47	78.8	6.96	12.2
MICR-1	4/15/2014 10:29		17.69	9.29	59.1	6.76	44.5
MICR-1	5/15/2014 10:54		20.74	8.85	62.9	7.2	55.3
MICR-1	5/21/2014 8:44	14.05	20.2	8.73	93.4	7.32	11.9
MICR-1	6/10/2014 10:01	6.2476	25.09	8.37	104.7	7.29	6.45
MICR-1	7/15/2014 12:26	2.7583	27.88	9.2	115.2	8.07	4.07
MICR-1	8/12/2014 10:39	4.3652	25.53	6.8	125.6	6.81	4.1
MICR-1	9/16/2014 10:38	1.7353	25.75	8.91	132.9	7.31	3.6
MICR-1	10/20/2014 10:12	5.7148	15.82	9.76	99.2	6.46	12.1

Mill Creek 2014 Sampling - Chemical Data

Station ID	Visit Date and Time	TDS mgL	TSS mgL	Alk Tot mgL	NH3 mgL	NH3 dc	CBOD-5 mgL	CBOD-5 dc
CHA-1	3/25/2014 11:15	58	1	16.8	0.041		2	< MDL 2, JQ
CHA-1	5/15/2014 12:19	77	29	17	0.02		2	< MDL 2
CHA-1	5/21/2014 10:29							
CHA-1	6/10/2014 11:36	71	12	34.9	0.183		2	< MDL 2
CHA-1	7/15/2014 14:26	59	25	24	0.064		2	< MDL 2
CHA-1	8/12/2014 12:57	53	17	16.4	0.048		2	< MDL 2
CHA-1	9/16/2014 12:06	80	16	21.3	0.054		2	< MDL 2
CHA-1	10/20/2014 11:35	82	32	11.7	0.047		2	< MDL 2
MICR-1	3/25/2014 9:37	51	3	21.2	0.006	< MDL .006	2	< MDL 2, JQ
MICR-1	4/15/2014 10:29	67	28	13	0.006	< MDL .006	2	< MDL 2
MICR-1	5/15/2014 10:54	71	33	17	0.006	< MDL .006	2	< MDL 2
MICR-1	5/21/2014 8:44							
MICR-1	6/10/2014 10:01	80	6	34.2	0.006	< MDL .006	2	< MDL 2
MICR-1	7/15/2014 12:26	76	7	38	0.006	< MDL .006	2	< MDL 2
MICR-1	8/12/2014 10:39	75	1	42.8	0.168		2	< MDL 2
MICR-1	9/16/2014 10:38	79	7	47.1	0.01	< MDL .01	2	< MDL 2
MICR-1	10/20/2014 10:12	88	6	26.4	0.01	< MDL .01	2	< MDL 2

Station ID	Visit Date and Time	NO2+NO3 mgL	NO2+NO3 dc	TKN mgL	TKN dc	DRP mgL	DRP dc	Tot P dc
CHA-1	3/25/2014 11:15	0.102		0.689		0.004	JI	
CHA-1	5/15/2014 12:19	0.079		0.693		0.004	JI	
CHA-1	5/21/2014 10:29							
CHA-1	6/10/2014 11:36	0.041		0.718		0.004	JI	
CHA-1	7/15/2014 14:26	0.048		0.627		0.004	JI	
CHA-1	8/12/2014 12:57	0.298		0.719		0.006	JI	
CHA-1	9/16/2014 12:06	0.023		0.538		0.006	JI	
CHA-1	10/20/2014 11:35	0.054		0.575		0.006	JI	
MICR-1	3/25/2014 9:37	0.243		0.515		0.004	JI	
MICR-1	4/15/2014 10:29	0.16		1.62		0.009	JI	
MICR-1	5/15/2014 10:54	0.157		0.62		0.005	JI	
MICR-1	5/21/2014 8:44							
MICR-1	6/10/2014 10:01	0.258		0.549		0.017		
MICR-1	7/15/2014 12:26	0.196		0.252		0.01		
MICR-1	8/12/2014 10:39	0.269		0.765		0.018		
MICR-1	9/16/2014 10:38	0.221		0.416		0.014		
MICR-1	10/20/2014 10:12	0.273		0.362		0.008	JI	

Appendix C

Alabama Water Watch Data

Alabama Water Watch 2014 Mill Creek Data

AWW Site Code	Waterbody	Latitude	Longitude	Site Description		
3015003	Mill Creek	32.533611	-85.095861	MC 39 at Lee Rd 728		
3015007	Mill Creek	32.51778200	-85.09318400	Behind Philadelphia Baptist Church		
3015002	Mill Creek	32.48762200	-85.05894200	at Poyner Drive and Poyner Court		
3017002	Mill Creek	32.47887700	-85.02140200	20th Avenue Bridge-upstream side		
3015013	Mill Creek	32.46573600	-85.00219500	Upstream of Bridge at Broad Street		

AwwSiteCode	Date	Time	Water Temp °C	Dissolved Oxygen (ppm)	pH
03015003	01/11/2013	9:45:00 AM	15.0	7.5	6.5
03015003	02/15/2013	10:15:00 AM	12.0	7.6	6.5
03015003	03/13/2013	9:45:00 AM	11.0	8.3	6.5
03015003	04/17/2013	9:45:00 AM	18.0	6.6	6.5
03015003	05/15/2013	9:45:00 AM	17.0	7.2	6.5
03015003	06/18/2013	9:45:00 AM	21.5	5.8	6.5
03015003	07/15/2013	10:30:00 AM	23.0	5.8	6.5
03015003	08/19/2013	10:00:00 AM	22.0	5.9	6.5
03015003	09/19/2013	11:15:00 AM	20.5	5.7	6.5
03015003	02/22/2014	11:30:00 AM	12.0	7.9	6.5
03015003	03/31/2014	1:30:00 PM	15.0	7.6	6.5
03015003	04/29/2014	2:30:00 PM	20.0	6.2	6.0
03015003	05/30/2014	1:15:00 PM	21.0	5.6	6.5
03015003	06/30/2014	7:00:00 AM	21.5	5.6	7.0
03015003	07/31/2014	2:30:00 PM	22.0	6.2	7.0
03015003	08/31/2014	12:00:00 PM	24.0	5.0	7.0
03015003	09/23/2014	9:00:00 AM	20.0	6.2	6.5
03015003	10/30/2014	10:00:00 AM	14.5	6.7	6.5
03015003	11/29/2014	2:15:00 PM	10.0	8.1	6.5
03015003	12/29/2014	12:45:00 PM	14.0	6.3	6.5
03015003	01/31/2015	9:00:00 AM	7.0	9.4	6.5
03015003	02/27/2015	4:00:00 PM	10.0	7.9	6.5
03015003	10/30/2015	11:30:00 AM	17.0	9.0	6.0
03015003	12/11/2015	1:30:00 PM	18.0	8.0	7.0
03015007	01/11/2013	10:15:00 AM	15.0	8.1	7.0
03015007	02/15/2013	10:45:00 AM	11.0	8.7	6.5
03015007	03/13/2013	10:15:00 AM	10.0	9.4	6.5
03015007	04/17/2013	10:15:00 AM	18.0	7.4	6.5
03015007	05/15/2013	10:30:00 AM	16.0	7.6	6.5

AwwSiteCode	Date	Time	Water Temp °C	Dissolved Oxygen (ppm)	pH
03015007	06/18/2013	10:30:00 AM	22.0	6.4	7.0
03015007	07/16/2013	10:30:00 AM	22.0	6.5	6.5
03015007	08/19/2013	10:45:00 AM	21.5	6.7	6.5
03015007	09/19/2013	10:30:00 AM	20.0	6.3	7.0
03015007	02/22/2014	10:30:00 AM	9.0	8.7	6.5
03015007	03/31/2014	1:00:00 PM	13.0	8.3	6.5
03015007	04/29/2014	3:30:00 PM	19.0	6.3	6.0
03015007	05/30/2014	2:00:00 PM	21.0	6.1	7.0
03015007	06/30/2014	3:30:00 PM	23.5	5.9	7.0
03015007	07/31/2014	2:00:00 PM	22.0	6.6	7.0
03015007	08/31/2014	12:45:00 PM	23.5	5.7	7.0
03015007	09/23/2014	3:15:00 PM	19.5	6.6	7.0
03015007	10/30/2014	9:15:00 AM	14.0	7.0	7.0
03015007	11/29/2014	1:45:00 PM	8.0	9.0	7.0
03015007	12/29/2014	1:30:00 PM	13.5	7.8	6.5
03015007	01/31/2015	8:30:00 AM	5.0	9.8	7.0
03015007	02/27/2015	3:30:00 PM	10.0	9.1	6.5
03015007	06/30/2015	9:45:00 AM	21.5	6.4	7.0
03015007	08/03/2015	9:40:00 AM	23.0	6.2	7.0
03015007	08/31/2015	10:00:00 AM	22.0	6.3	7.0
03015007	10/30/2015	1:25:00 PM	18.0	7.0	6.5
03015007	12/22/2015	2:15:00 PM	15.0	8.4	6.5
03015002	01/26/2013	11:15:00 AM	12.0	6.7	6.0
03015002	03/05/2013	8:45:00 AM	11.0	8.3	6.5
03015002	03/27/2013	2:45:00 PM	15.0	9.6	6.0
03015002	04/29/2013	2:00:00 PM	20.0	6.0	6.0
03015002	06/05/2013	1:00:00 PM	31.0	3.1	6.0
03015002	07/16/2013	11:00:00 AM	25.0	4.2	6.5
03015002	08/15/2013	12:30:00 PM	23.0	5.3	6.0
03015002	09/20/2013	11:45:00 AM	22.5	1.8	6.0
03015002	10/14/2013	9:30:00 AM	18.0	2.4	6.0
03015002	11/20/2013	11:45:00 AM	11.5	4.3	6.5
03015002	12/12/2013	9:15:00 AM	8.0	6.6	6.5
03015002	02/07/2014	10:15:00 AM	6.0	10.5	6.0
03015002	03/06/2014	11:45:00 AM	9.0	8.7	6.5
03015002	04/04/2014	10:00:00 AM	18.0	6.6	6.5
03015002	05/21/2014	1:15:00 PM	23.0	5.4	6.0
03015002	06/20/2014	10:15:00 AM	25.0	3.6	6.5
03015002	07/11/2014	12:30:00 PM	26.0	4.1	6.0

AwwSiteCode	Date	Time	Water Temp °C	Dissolved Oxygen (ppm)	pH
03015002	09/17/2014	3:45:00 PM	26.0	2.9	6.0
03015002	11/13/2014	1:15:00 PM	16.0	6.5	6.0
03015002	12/19/2014	9:45:00 AM	9.0	7.0	6.0
03015002	01/22/2015	2:30:00 PM	11.0	8.4	6.0
03015002	02/17/2015	2:30:00 PM	10.0	9.7	6.5
03015002	05/21/2015	2:15:00 PM	24.5	3.6	6.0
03015002	07/28/2016	10:15:00 AM	24.0	1.3	6.5
03015002	09/30/2016	11:45:00 AM	19.0	1.5	6.5
03015002	10/21/2016	8:55:00 AM	18.0	1.5	6.5
03015002	11/21/2016	10:30:00 AM	6.0	3.5	6.5
03015002	12/06/2016	12:00:00 PM	14.0	6.1	5.5
03017002	04/03/2013	12:00:00 PM	16.5	9.2	9.0
03017002	06/03/2013	1:45:00 PM	27.9	6.6	7.0
03017002	07/22/2013	12:45:00 PM	26.4	6.3	7.0
03017002	09/05/2013	4:00:00 PM	28.7	6.1	7.0
03017002	10/03/2013	3:30:00 PM	23.5	7.5	7.0
03017002	10/24/2013	3:00:00 PM	17.0	7.4	7.0
03017002	11/20/2013	2:30:00 PM	13.8	7.5	7.0
03017002	11/25/2013	2:00:00 PM	10.7	8.5	7.0
03017002	04/08/2014	2:00:00 PM	20.2	7.8	6.5
03017002	08/28/2014	12:30:00 PM	26.5	5.5	6.5
03017002	10/03/2014	9:30:00 AM	23.0	5.4	6.5
03017002	10/31/2014	10:00:00 AM	14.2	8.0	7.0
03017002	11/21/2014	1:00:00 PM	10.8	8.5	7.0
03017002	01/20/2015	10:45:00 AM	8.5	9.8	7.0
03017002	02/10/2015	10:15:00 AM	10.5	9.4	7.0
03017002	03/05/2015	2:45:00 PM	16.0	8.3	7.0
03017002	04/02/2015	2:00:00 PM	20.5	7.9	7.0
03017002	09/24/2015	2:25:00 PM	22.9	7.0	7.0
03017002	10/29/2015	2:30:00 PM	20.6	6.0	7.0
03015013	06/20/2014	11:45:00 AM	27.0	7.4	7.0
03015013	07/11/2014	10:15:00 AM	25.0	6.7	7.0
03015013	09/17/2014	1:30:00 PM	26.0	7.1	8.0
03015013	11/12/2014	1:45:00 PM	15.0	9.8	7.0
03015013	12/19/2014	10:15:00 AM	9.0	10.7	7.0
03015013	01/22/2015	3:00:00 PM	11.0	10.0	7.0
03015013	02/18/2015	12:00:00 PM	8.0	10.9	6.5
03015013	05/21/2015	12:15:00 PM	24.0	8.4	7.0
03015013	10/08/2016	5:20:00 PM	24.0	5.7	7.5

**Appendix D
Mill Creek September 2014
72-Hour Study Data**

Station ID	Date and Time	Temp °C	SpCond uS/com	pH	DO mgL	Station ID	Date and Time	Temp °C	SpCond uS/com	pH	DO mgL
CHA-1	9/8/2014 8:00	24.29	101	6.57	4.87	CHA-1	9/11/2014 8:15	24.01	100	6.48	4.93
CHA-1	9/8/2014 8:15	24.33	99	6.57	4.82	CHA-1	9/11/2014 8:30	24.05	100	6.48	4.92
CHA-1	9/8/2014 8:30	24.34	97	6.58	4.71	MICR-1	9/8/2014 10:26	24.97	113	7.66	7.74
CHA-1	9/8/2014 8:45	24.36	95	6.58	4.66	MICR-1	9/8/2014 10:41	24.96	113	7.6	7.71
CHA-1	9/8/2014 9:00	24.39	93	6.58	4.62	MICR-1	9/8/2014 10:56	24.96	114	7.57	7.73
CHA-1	9/8/2014 9:15	24.4	92	6.58	4.61	MICR-1	9/8/2014 11:11	25.01	115	7.57	7.75
CHA-1	9/8/2014 9:30	24.44	92	6.58	4.61	MICR-1	9/8/2014 11:26	25.06	114	7.58	7.83
CHA-1	9/8/2014 9:45	24.46	91	6.58	4.63	MICR-1	9/8/2014 11:41	25.1	115	7.58	7.85
CHA-1	9/8/2014 10:00	24.46	90	6.59	4.64	MICR-1	9/8/2014 11:56	25.15	114	7.59	7.88
CHA-1	9/8/2014 10:15	24.45	90	6.58	4.59	MICR-1	9/8/2014 12:11	25.26	115	7.59	7.95
CHA-1	9/8/2014 10:30	24.48	90	6.58	4.59	MICR-1	9/8/2014 12:26	25.36	115	7.61	8.02
CHA-1	9/8/2014 10:45	24.52	90	6.58	4.65	MICR-1	9/8/2014 12:41	25.48	116	7.62	8.05
CHA-1	9/8/2014 11:00	24.55	89	6.59	4.69	MICR-1	9/8/2014 12:56	25.66	116	7.63	8.11
CHA-1	9/8/2014 11:15	24.59	89	6.59	4.71	MICR-1	9/8/2014 13:11	25.83	116	7.65	8.15
CHA-1	9/8/2014 11:30	24.61	89	6.59	4.66	MICR-1	9/8/2014 13:26	26.12	116	7.67	8.19
CHA-1	9/8/2014 11:45	24.66	89	6.59	4.73	MICR-1	9/8/2014 13:41	26.29	116	7.68	8.2
CHA-1	9/8/2014 12:00	24.69	89	6.59	4.72	MICR-1	9/8/2014 13:56	26.26	116	7.69	8.1
CHA-1	9/8/2014 12:15	24.73	88	6.6	4.8	MICR-1	9/8/2014 14:11	26.45	117	7.67	8.08
CHA-1	9/8/2014 12:30	24.71	88	6.59	4.83	MICR-1	9/8/2014 14:26	27.02	115	7.68	8.23
CHA-1	9/8/2014 12:45	24.73	88	6.58	4.83	MICR-1	9/8/2014 14:41	26.7	116	7.67	8.11
CHA-1	9/8/2014 13:00	24.89	88	6.59	4.86	MICR-1	9/8/2014 14:56	26.71	116	7.66	8.09
CHA-1	9/8/2014 13:15	25	88	6.6	4.82	MICR-1	9/8/2014 15:11	26.85	116	7.66	8.14
CHA-1	9/8/2014 13:30	25.09	87	6.6	4.87	MICR-1	9/8/2014 15:26	26.92	116	7.67	8.13
CHA-1	9/8/2014 13:45	25.17	87	6.6	4.86	MICR-1	9/8/2014 15:41	27.02	115	7.68	8.16
CHA-1	9/8/2014 14:00	25.25	87	6.6	4.86	MICR-1	9/8/2014 15:56	27.03	116	7.69	8.12
CHA-1	9/8/2014 14:15	25.25	87	6.61	4.85	MICR-1	9/8/2014 16:11	27.03	116	7.69	8.16

Station ID	Date and Time	Temp °C	SpCond uS/com	pH	DO mgL	Station ID	Date and Time	Temp °C	SpCond uS/com	pH	DO mgL
CHA-1	9/8/2014 14:30	25.3	87	6.6	4.9	MICR-1	9/8/2014 16:26	27.12	117	7.71	8.19
CHA-1	9/8/2014 14:45	25.41	86	6.59	4.87	MICR-1	9/8/2014 16:41	27.12	116	7.69	8.11
CHA-1	9/8/2014 15:00	25.56	86	6.6	4.91	MICR-1	9/8/2014 16:56	27.11	117	7.67	8.07
CHA-1	9/8/2014 15:15	25.6	85	6.6	4.91	MICR-1	9/8/2014 17:11	27.29	116	7.69	8.03
CHA-1	9/8/2014 15:30	25.56	85	6.59	4.93	MICR-1	9/8/2014 17:26	27.62	116	7.74	8.16
CHA-1	9/8/2014 15:45	25.52	85	6.59	4.9	MICR-1	9/8/2014 17:41	27.54	116	7.74	8.03
CHA-1	9/8/2014 16:00	25.46	86	6.59	4.87	MICR-1	9/8/2014 17:56	27.33	117	7.7	7.88
CHA-1	9/8/2014 16:15	25.45	86	6.59	4.83	MICR-1	9/8/2014 18:11	27.17	117	7.67	7.77
CHA-1	9/8/2014 16:30	25.42	86	6.59	4.84	MICR-1	9/8/2014 18:26	27.02	117	7.62	7.59
CHA-1	9/8/2014 16:45	25.38	85	6.59	4.84	MICR-1	9/8/2014 18:41	26.9	117	7.58	7.45
CHA-1	9/8/2014 17:00	25.35	85	6.58	4.83	MICR-1	9/8/2014 18:56	26.75	117	7.55	7.3
CHA-1	9/8/2014 17:15	25.32	84	6.59	4.88	MICR-1	9/8/2014 19:11	26.65	117	7.53	7.27
CHA-1	9/8/2014 17:30	25.31	84	6.58	4.87	MICR-1	9/8/2014 19:26	26.54	117	7.51	7.18
CHA-1	9/8/2014 17:45	25.29	83	6.58	4.87	MICR-1	9/8/2014 19:41	26.48	117	7.51	7.13
CHA-1	9/8/2014 18:00	25.27	83	6.57	4.84	MICR-1	9/8/2014 19:56	26.38	117	7.48	7.05
CHA-1	9/8/2014 18:15	25.25	82	6.57	4.82	MICR-1	9/8/2014 20:11	26.28	117	7.41	6.79
CHA-1	9/8/2014 18:30	25.22	82	6.56	4.81	MICR-1	9/8/2014 20:26	26.21	118	7.38	6.6
CHA-1	9/8/2014 18:45	25.17	82	6.55	4.8	MICR-1	9/8/2014 20:41	26.1	118	7.4	6.77
CHA-1	9/8/2014 19:00	25.13	81	6.54	4.75	MICR-1	9/8/2014 20:56	26.06	118	7.4	6.8
CHA-1	9/8/2014 19:15	25.07	81	6.54	4.71	MICR-1	9/8/2014 21:11	26.01	118	7.42	6.87
CHA-1	9/8/2014 19:30	25.03	81	6.53	4.68	MICR-1	9/8/2014 21:26	25.99	119	7.41	6.88
CHA-1	9/8/2014 19:45	24.98	80	6.52	4.62	MICR-1	9/8/2014 21:41	25.93	118	7.43	6.91
CHA-1	9/8/2014 20:00	24.95	80	6.51	4.64	MICR-1	9/8/2014 21:56	25.9	118	7.43	6.96
CHA-1	9/8/2014 20:15	24.93	80	6.51	4.62	MICR-1	9/8/2014 22:11	25.87	119	7.43	6.97
CHA-1	9/8/2014 20:30	24.91	79	6.51	4.62	MICR-1	9/8/2014 22:26	25.85	119	7.43	6.96
CHA-1	9/8/2014 20:45	24.88	79	6.52	4.66	MICR-1	9/8/2014 22:41	25.81	119	7.43	6.97
CHA-1	9/8/2014 21:00	24.87	78	6.5	4.69	MICR-1	9/8/2014 22:56	25.78	119	7.43	6.96

Station ID	Date and Time	Temp °C	SpCond uS/com	pH	DO mgL	Station ID	Date and Time	Temp °C	SpCond uS/com	pH	DO mgL
CHA-1	9/8/2014 21:15	24.85	79	6.51	4.7	MICR-1	9/8/2014 23:11	25.74	119	7.42	6.97
CHA-1	9/8/2014 21:30	24.84	78	6.49	4.71	MICR-1	9/8/2014 23:26	25.72	119	7.43	6.96
CHA-1	9/8/2014 21:45	24.83	78	6.49	4.68	MICR-1	9/8/2014 23:41	25.68	120	7.42	6.96
CHA-1	9/8/2014 22:00	24.81	78	6.5	4.67	MICR-1	9/8/2014 23:56	25.65	120	7.43	6.97
CHA-1	9/8/2014 22:15	24.79	78	6.49	4.69	MICR-1	9/9/2014 0:11	25.61	120	7.43	7.01
CHA-1	9/8/2014 22:30	24.78	78	6.5	4.73	MICR-1	9/9/2014 0:26	25.57	121	7.43	6.93
CHA-1	9/8/2014 22:45	24.77	78	6.49	4.75	MICR-1	9/9/2014 0:41	25.53	121	7.42	6.97
CHA-1	9/8/2014 23:00	24.75	78	6.5	4.78	MICR-1	9/9/2014 0:56	25.49	121	7.42	6.98
CHA-1	9/8/2014 23:15	24.73	78	6.5	4.78	MICR-1	9/9/2014 1:11	25.45	122	7.42	7
CHA-1	9/8/2014 23:30	24.7	78	6.51	4.76	MICR-1	9/9/2014 1:26	25.42	122	7.42	6.98
CHA-1	9/8/2014 23:45	24.67	78	6.51	4.74	MICR-1	9/9/2014 1:41	25.37	122	7.42	6.98
CHA-1	9/9/2014 0:00	24.64	78	6.51	4.75	MICR-1	9/9/2014 1:56	25.33	122	7.42	7
CHA-1	9/9/2014 0:15	24.61	78	6.51	4.75	MICR-1	9/9/2014 2:11	25.3	123	7.42	7.01
CHA-1	9/9/2014 0:30	24.59	79	6.47	4.25	MICR-1	9/9/2014 2:26	25.26	123	7.42	7.02
CHA-1	9/9/2014 0:45	24.57	79	6.44	3.98	MICR-1	9/9/2014 2:41	25.24	123	7.43	7.03
CHA-1	9/9/2014 1:00	24.55	79	6.45	3.89	MICR-1	9/9/2014 2:56	25.22	124	7.42	7
CHA-1	9/9/2014 1:15	24.52	79	6.46	4.17	MICR-1	9/9/2014 3:11	25.2	124	7.43	7.04
CHA-1	9/9/2014 1:30	24.49	79	6.48	4.39	MICR-1	9/9/2014 3:26	25.18	124	7.43	7.03
CHA-1	9/9/2014 1:45	24.48	79	6.46	4.13	MICR-1	9/9/2014 3:41	25.16	124	7.43	7.06
CHA-1	9/9/2014 2:00	24.45	79	6.48	4.34	MICR-1	9/9/2014 3:56	25.12	124	7.43	7.04
CHA-1	9/9/2014 2:15	24.43	79	6.47	4.33	MICR-1	9/9/2014 4:11	25.11	124	7.43	7.04
CHA-1	9/9/2014 2:30	24.42	79	6.47	4.3	MICR-1	9/9/2014 4:26	25.08	125	7.42	7.04
CHA-1	9/9/2014 2:45	24.4	79	6.48	4.33	MICR-1	9/9/2014 4:41	25.05	125	7.43	7.06
CHA-1	9/9/2014 3:00	24.39	79	6.49	4.41	MICR-1	9/9/2014 4:56	25.02	125	7.42	7.06
CHA-1	9/9/2014 3:15	24.38	80	6.5	4.44	MICR-1	9/9/2014 5:11	25	125	7.43	7.1
CHA-1	9/9/2014 3:30	24.36	79	6.49	4.55	MICR-1	9/9/2014 5:26	24.98	125	7.43	7.09
CHA-1	9/9/2014 3:45	24.35	79	6.5	4.54	MICR-1	9/9/2014 5:41	24.95	126	7.43	7.09
CHA-1	9/9/2014 4:00	24.34	80	6.5	4.54	MICR-1	9/9/2014 5:56	24.92	126	7.43	7.07
CHA-1	9/9/2014 4:15	24.33	80	6.5	4.53	MICR-1	9/9/2014 6:11	24.9	126	7.44	7.11
CHA-1	9/9/2014 4:30	24.32	80	6.51	4.49	MICR-1	9/9/2014 6:26	24.87	126	7.44	7.13
CHA-1	9/9/2014 4:45	24.31	80	6.49	4.5	MICR-1	9/9/2014 6:41	24.84	126	7.44	7.15
CHA-1	9/9/2014 5:00	24.31	80	6.49	4.42	MICR-1	9/9/2014 6:56	24.83	126	7.44	7.16
CHA-1	9/9/2014 5:15	24.3	80	6.5	4.43	MICR-1	9/9/2014 7:11	24.81	127	7.44	7.15
CHA-1	9/9/2014 5:30	24.29	80	6.49	4.43	MICR-1	9/9/2014 7:26	24.8	127	7.44	7.23
CHA-1	9/9/2014 5:45	24.29	80	6.49	4.46	MICR-1	9/9/2014 7:41	24.8	127	7.45	7.26
CHA-1	9/9/2014 6:00	24.27	80	6.49	4.48	MICR-1	9/9/2014 7:56	24.79	127	7.45	7.29
CHA-1	9/9/2014 6:15	24.26	80	6.5	4.44	MICR-1	9/9/2014 8:11	24.79	127	7.46	7.33

Station ID	Date and Time	Temp °C	SpCond uS/com	pH	DO mgL	Station ID	Date and Time	Temp °C	SpCond uS/com	pH	DO mgL
CHA-1	9/9/2014 6:30	24.26	80	6.49	4.43	MICR-1	9/9/2014 8:26	24.81	127	7.47	7.36
CHA-1	9/9/2014 6:45	24.26	80	6.49	4.39	MICR-1	9/9/2014 8:41	24.83	128	7.48	7.48
CHA-1	9/9/2014 7:00	24.26	80	6.49	4.39	MICR-1	9/9/2014 8:56	24.84	128	7.49	7.52
CHA-1	9/9/2014 7:15	24.26	80	6.49	4.3	MICR-1	9/9/2014 9:11	24.84	128	7.5	7.53
CHA-1	9/9/2014 7:30	24.25	81	6.52	4.3	MICR-1	9/9/2014 9:26	24.86	127	7.51	7.63
CHA-1	9/9/2014 7:45	24.24	80	6.53	4.3	MICR-1	9/9/2014 9:41	24.89	127	7.52	7.7
CHA-1	9/9/2014 8:00	24.24	80	6.51	4.3	MICR-1	9/9/2014 9:56	24.9	128	7.53	7.75
CHA-1	9/9/2014 8:15	24.27	80	6.52	4.3	MICR-1	9/9/2014 10:11	24.95	128	7.55	7.84
CHA-1	9/9/2014 8:30	24.28	80	6.51	4.22	MICR-1	9/9/2014 10:26	24.99	127	7.57	7.94
CHA-1	9/9/2014 8:45	24.29	80	6.5	4.23	MICR-1	9/9/2014 10:41	25.02	127	7.59	8.01
CHA-1	9/9/2014 9:00	24.3	80	6.5	4.2	MICR-1	9/9/2014 10:56	25.05	127	7.6	8.09
CHA-1	9/9/2014 9:15	24.3	80	6.5	4.27	MICR-1	9/9/2014 11:11	25.1	128	7.62	8.09
CHA-1	9/9/2014 9:30	24.3	80	6.5	4.09	MICR-1	9/9/2014 11:26	25.2	127	7.65	8.27
CHA-1	9/9/2014 9:45	24.32	80	6.5	4.16	MICR-1	9/9/2014 11:41	25.26	128	7.67	8.3
CHA-1	9/9/2014 10:00	24.33	80	6.5	4.18	MICR-1	9/9/2014 11:56	25.3	128	7.69	8.28
CHA-1	9/9/2014 10:15	24.34	80	6.49	4.12	MICR-1	9/9/2014 12:11	25.42	128	7.72	8.43
CHA-1	9/9/2014 10:30	24.34	80	6.49	4.16	MICR-1	9/9/2014 12:26	25.55	128	7.76	8.54
CHA-1	9/9/2014 10:45	24.34	80	6.5	4.23	MICR-1	9/9/2014 12:41	25.61	128	7.79	8.63
CHA-1	9/9/2014 11:00	24.34	80	6.49	4.29	MICR-1	9/9/2014 12:56	25.7	128	7.81	8.62
CHA-1	9/9/2014 11:15	24.35	80	6.5	4.29	MICR-1	9/9/2014 13:11	25.75	129	7.83	8.68
CHA-1	9/9/2014 11:30	24.38	80	6.5	4.26	MICR-1	9/9/2014 13:26	25.79	128	7.85	8.7
CHA-1	9/9/2014 11:45	24.41	80	6.5	4.29	MICR-1	9/9/2014 13:41	25.81	128	7.86	8.65
CHA-1	9/9/2014 12:00	24.42	80	6.5	4.24	MICR-1	9/9/2014 13:56	25.86	128	7.88	8.68
CHA-1	9/9/2014 12:15	24.46	80	6.5	4.3	MICR-1	9/9/2014 14:11	26.3	127	7.9	8.78
CHA-1	9/9/2014 12:30	24.48	80	6.5	4.3	MICR-1	9/9/2014 14:26	27.05	124	7.93	8.88
CHA-1	9/9/2014 12:45	24.48	80	6.49	4.28	MICR-1	9/9/2014 14:41	26.86	124	7.92	8.88
CHA-1	9/9/2014 13:00	24.49	80	6.5	4.32	MICR-1	9/9/2014 14:56	26.98	124	7.93	8.89
CHA-1	9/9/2014 13:15	24.51	80	6.5	4.32	MICR-1	9/9/2014 15:11	27.21	122	7.91	8.86
CHA-1	9/9/2014 13:30	24.54	80	6.49	4.37	MICR-1	9/9/2014 15:26	27.27	122	7.93	8.93

Station ID	Date and Time	Temp °C	SpCond uS/com	pH	DO mgL	Station ID	Date and Time	Temp °C	SpCond uS/com	pH	DO mgL
CHA-1	9/9/2014 13:45	24.56	80	6.5	4.33	MICR-1	9/9/2014 15:41	27.37	121	7.97	8.97
CHA-1	9/9/2014 14:00	24.62	80	6.49	4.33	MICR-1	9/9/2014 15:56	27.18	123	7.97	8.95
CHA-1	9/9/2014 14:15	24.74	80	6.49	4.32	MICR-1	9/9/2014 16:11	27.05	124	7.97	8.92
CHA-1	9/9/2014 14:30	24.69	80	6.49	4.33	MICR-1	9/9/2014 16:26	26.99	124	7.96	8.85
CHA-1	9/9/2014 14:45	24.67	80	6.47	4.24	MICR-1	9/9/2014 16:41	26.98	125	7.97	8.85
CHA-1	9/9/2014 15:00	24.73	80	6.48	4.29	MICR-1	9/9/2014 16:56	26.96	125	7.94	8.72
CHA-1	9/9/2014 15:15	24.7	80	6.48	4.31	MICR-1	9/9/2014 17:11	26.93	126	7.92	8.69
CHA-1	9/9/2014 15:30	24.67	81	6.48	4.3	MICR-1	9/9/2014 17:26	26.91	126	7.92	8.65
CHA-1	9/9/2014 15:45	24.67	81	6.48	4.32	MICR-1	9/9/2014 17:41	26.84	127	7.91	8.64
CHA-1	9/9/2014 16:00	24.66	81	6.48	4.29	MICR-1	9/9/2014 17:56	26.79	128	7.92	8.62
CHA-1	9/9/2014 16:15	24.69	81	6.48	4.31	MICR-1	9/9/2014 18:11	26.79	128	7.91	8.57
CHA-1	9/9/2014 16:30	24.69	81	6.48	4.31	MICR-1	9/9/2014 18:26	26.78	127	7.9	8.54
CHA-1	9/9/2014 16:45	24.68	81	6.47	4.27	MICR-1	9/9/2014 18:41	26.77	127	7.91	8.49
CHA-1	9/9/2014 17:00	24.66	82	6.48	4.28	MICR-1	9/9/2014 18:56	26.5	129	7.88	8.34
CHA-1	9/9/2014 17:15	24.66	82	6.48	4.3	MICR-1	9/9/2014 19:11	26.33	130	7.83	8.09
CHA-1	9/9/2014 17:30	24.64	82	6.48	4.33	MICR-1	9/9/2014 19:26	26.19	130	7.77	7.89
CHA-1	9/9/2014 17:45	24.64	82	6.47	4.33	MICR-1	9/9/2014 19:41	26.05	130	7.71	7.74
CHA-1	9/9/2014 18:00	24.63	82	6.47	4.32	MICR-1	9/9/2014 19:56	25.93	131	7.64	7.51
CHA-1	9/9/2014 18:15	24.62	82	6.48	4.33	MICR-1	9/9/2014 20:11	25.83	131	7.59	7.3
CHA-1	9/9/2014 18:30	24.61	82	6.48	4.34	MICR-1	9/9/2014 20:26	25.74	132	7.53	7.1
CHA-1	9/9/2014 18:45	24.59	82	6.47	4.36	MICR-1	9/9/2014 20:41	25.64	132	7.51	6.98
CHA-1	9/9/2014 19:00	24.57	82	6.48	4.38	MICR-1	9/9/2014 20:56	25.56	132	7.48	6.93
CHA-1	9/9/2014 19:15	24.55	82	6.49	4.39	MICR-1	9/9/2014 21:11	25.49	132	7.42	6.62
CHA-1	9/9/2014 19:30	24.52	82	6.49	4.45	MICR-1	9/9/2014 21:26	25.41	140	7.36	6.38
CHA-1	9/9/2014 19:45	24.5	82	6.49	4.44	MICR-1	9/9/2014 21:41	25.32	137	7.36	6.52
CHA-1	9/9/2014 20:00	24.48	82	6.48	4.42	MICR-1	9/9/2014 21:56	25.24	135	7.38	6.62
CHA-1	9/9/2014 20:15	24.47	82	6.48	4.47	MICR-1	9/9/2014 22:11	25.17	134	7.38	6.72

Station ID	Date and Time	Temp °C	SpCond uS/com	pH	DO mgL	Station ID	Date and Time	Temp °C	SpCond uS/com	pH	DO mgL
CHA-1	9/9/2014 20:30	24.45	82	6.49	4.42	MICR-1	9/9/2014 22:26	25.11	133	7.39	6.78
CHA-1	9/9/2014 20:45	24.43	82	6.49	4.44	MICR-1	9/9/2014 22:41	25.06	133	7.4	6.81
CHA-1	9/9/2014 21:00	24.41	82	6.49	4.45	MICR-1	9/9/2014 22:56	25.02	133	7.4	6.87
CHA-1	9/9/2014 21:15	24.38	82	6.49	4.47	MICR-1	9/9/2014 23:11	24.96	133	7.41	6.9
CHA-1	9/9/2014 21:30	24.36	82	6.5	4.53	MICR-1	9/9/2014 23:26	24.92	132	7.41	6.92
CHA-1	9/9/2014 21:45	24.35	82	6.49	4.53	MICR-1	9/9/2014 23:41	24.88	132	7.41	6.92
CHA-1	9/9/2014 22:00	24.33	82	6.49	4.52	MICR-1	9/9/2014 23:56	24.84	132	7.41	6.91
CHA-1	9/9/2014 22:15	24.31	82	6.5	4.52	MICR-1	9/10/2014 0:11	24.81	132	7.41	6.94
CHA-1	9/9/2014 22:30	24.29	83	6.49	4.55	MICR-1	9/10/2014 0:26	24.76	132	7.42	6.97
CHA-1	9/9/2014 22:45	24.27	83	6.5	4.53	MICR-1	9/10/2014 0:41	24.73	132	7.41	6.96
CHA-1	9/9/2014 23:00	24.25	83	6.49	4.49	MICR-1	9/10/2014 0:56	24.69	132	7.41	6.96
CHA-1	9/9/2014 23:15	24.23	83	6.49	4.44	MICR-1	9/10/2014 1:11	24.65	133	7.41	6.96
CHA-1	9/9/2014 23:30	24.21	83	6.49	4.53	MICR-1	9/10/2014 1:26	24.62	132	7.4	6.93
CHA-1	9/9/2014 23:45	24.19	83	6.49	4.48	MICR-1	9/10/2014 1:41	24.58	132	7.4	6.94
CHA-1	9/10/2014 0:00	24.17	83	6.5	4.48	MICR-1	9/10/2014 1:56	24.55	132	7.4	6.95
CHA-1	9/10/2014 0:15	24.15	83	6.49	4.46	MICR-1	9/10/2014 2:11	24.53	132	7.4	6.97
CHA-1	9/10/2014 0:30	24.13	83	6.5	4.49	MICR-1	9/10/2014 2:26	24.5	132	7.39	6.94
CHA-1	9/10/2014 0:45	24.11	83	6.5	4.48	MICR-1	9/10/2014 2:41	24.47	132	7.39	6.92
CHA-1	9/10/2014 1:00	24.1	83	6.49	4.48	MICR-1	9/10/2014 2:56	24.44	132	7.39	6.92
CHA-1	9/10/2014 1:15	24.08	83	6.49	4.52	MICR-1	9/10/2014 3:11	24.44	132	7.39	6.97
CHA-1	9/10/2014 1:30	24.05	83	6.5	4.54	MICR-1	9/10/2014 3:26	24.43	132	7.39	6.96
CHA-1	9/10/2014 1:45	24.04	83	6.5	4.52	MICR-1	9/10/2014 3:41	24.43	132	7.39	6.95
CHA-1	9/10/2014 2:00	24.02	84	6.49	4.6	MICR-1	9/10/2014 3:56	24.42	132	7.39	6.98
CHA-1	9/10/2014 2:15	24	84	6.49	4.62	MICR-1	9/10/2014 4:11	24.41	133	7.39	6.95
CHA-1	9/10/2014 2:30	23.99	84	6.5	4.61	MICR-1	9/10/2014 4:26	24.4	132	7.39	6.94
CHA-1	9/10/2014 2:45	23.97	84	6.5	4.67	MICR-1	9/10/2014 4:41	24.38	133	7.39	6.96
CHA-1	9/10/2014 3:00	23.95	84	6.5	4.7	MICR-1	9/10/2014 4:56	24.38	133	7.39	6.92

Station ID	Date and Time	Temp °C	SpCond uS/com	pH	DO mgL	Station ID	Date and Time	Temp °C	SpCond uS/com	pH	DO mgL
CHA-1	9/10/2014 3:15	23.97	85	6.5	4.64	MICR-1	9/10/2014 5:11	24.38	132	7.39	6.92
CHA-1	9/10/2014 3:30	23.98	85	6.5	4.62	MICR-1	9/10/2014 5:26	24.36	132	7.39	6.94
CHA-1	9/10/2014 3:45	23.98	85	6.49	4.61	MICR-1	9/10/2014 5:41	24.36	132	7.39	6.98
CHA-1	9/10/2014 4:00	23.99	85	6.49	4.61	MICR-1	9/10/2014 5:56	24.35	133	7.39	6.98
CHA-1	9/10/2014 4:15	23.99	85	6.49	4.58	MICR-1	9/10/2014 6:11	24.34	133	7.39	7
CHA-1	9/10/2014 4:30	24	85	6.5	4.54	MICR-1	9/10/2014 6:26	24.33	132	7.39	7.02
CHA-1	9/10/2014 4:45	24.01	85	6.51	4.54	MICR-1	9/10/2014 6:41	24.32	132	7.41	7.02
CHA-1	9/10/2014 5:00	24	85	6.5	4.54	MICR-1	9/10/2014 6:56	24.31	132	7.41	7.06
CHA-1	9/10/2014 5:15	24.01	85	6.51	4.52	MICR-1	9/10/2014 7:11	24.31	132	7.41	7.06
CHA-1	9/10/2014 5:30	24.01	85	6.51	4.46	MICR-1	9/10/2014 7:26	24.31	132	7.41	7.09
CHA-1	9/10/2014 5:45	24.01	86	6.51	4.48	MICR-1	9/10/2014 7:41	24.32	132	7.42	7.16
CHA-1	9/10/2014 6:00	24.01	86	6.49	4.51	MICR-1	9/10/2014 7:56	24.33	132	7.43	7.22
CHA-1	9/10/2014 6:15	24	86	6.5	4.5	MICR-1	9/10/2014 8:11	24.35	132	7.44	7.31
CHA-1	9/10/2014 6:30	24.01	86	6.51	4.5	MICR-1	9/10/2014 8:26	24.37	131	7.45	7.34
CHA-1	9/10/2014 6:45	24.01	87	6.49	4.55	MICR-1	9/10/2014 8:41	24.41	132	7.47	7.46
CHA-1	9/10/2014 7:00	24.01	87	6.5	4.47	MICR-1	9/10/2014 8:56	24.45	131	7.48	7.6
CHA-1	9/10/2014 7:15	24.01	87	6.51	4.47	MICR-1	9/10/2014 9:11	24.5	131	7.5	7.66
CHA-1	9/10/2014 7:30	24.02	87	6.51	4.47	MICR-1	9/10/2014 9:26	24.58	132	7.5	7.77
CHA-1	9/10/2014 7:45	24.02	87	6.5	4.4	MICR-1	9/10/2014 9:41	24.68	131	7.51	7.87
CHA-1	9/10/2014 8:00	24.03	87	6.5	4.39	MICR-1	9/10/2014 9:56	24.77	132	7.52	8.02
CHA-1	9/10/2014 8:15	24.04	87	6.51	4.36	MICR-1	9/10/2014 10:11	24.92	132	7.54	8.19
CHA-1	9/10/2014 8:30	24.05	87	6.5	4.35	MICR-1	9/10/2014 10:26	24.94	132	7.6	8.3
CHA-1	9/10/2014 8:45	24.08	87	6.5	4.27	MICR-1	9/10/2014 10:41	25.1	132	7.61	8.39
CHA-1	9/10/2014 9:00	24.08	89	6.48	4.25	MICR-1	9/10/2014 10:56	25.28	132	7.64	8.46
CHA-1	9/10/2014 9:15	24.09	89	6.5	4.41	MICR-1	9/10/2014 11:11	25.52	132	7.67	8.62
CHA-1	9/10/2014 9:30	24.14	89	6.5	4.51	MICR-1	9/10/2014 11:26	25.93	132	7.71	8.75
CHA-1	9/10/2014 9:45	24.18	89	6.5	4.58	MICR-1	9/10/2014 11:41	25.89	132	7.73	8.68

Station ID	Date and Time	Temp °C	SpCond uS/com	pH	DO mgL	Station ID	Date and Time	Temp °C	SpCond uS/com	pH	DO mgL
CHA-1	9/10/2014 10:00	24.2	89	6.5	4.6	MICR-1	9/10/2014 11:56	25.85	133	7.75	8.69
CHA-1	9/10/2014 10:15	24.25	90	6.51	4.65	MICR-1	9/10/2014 12:11	25.95	132	7.77	8.75
CHA-1	9/10/2014 10:30	24.25	90	6.51	4.66	MICR-1	9/10/2014 12:26	26.22	132	7.8	8.83
CHA-1	9/10/2014 10:45	24.26	91	6.51	4.68	MICR-1	9/10/2014 12:41	26.32	132	7.84	8.82
CHA-1	9/10/2014 11:00	24.25	91	6.5	4.66	MICR-1	9/10/2014 12:56	26.33	133	7.88	8.84
CHA-1	9/10/2014 11:15	24.35	91	6.5	4.72	MICR-1	9/10/2014 13:11	26.41	133	7.91	8.89
CHA-1	9/10/2014 11:30	24.43	91	6.51	4.68	MICR-1	9/10/2014 13:26	26.68	132	7.92	8.91
CHA-1	9/10/2014 11:45	24.43	91	6.51	4.76	MICR-1	9/10/2014 13:41	26.95	133	7.95	9.03
CHA-1	9/10/2014 12:00	24.5	91	6.5	4.77	MICR-1	9/10/2014 13:56	27.05	132	7.99	8.97
CHA-1	9/10/2014 12:15	24.48	91	6.51	4.77	MICR-1	9/10/2014 14:11	27.24	132	8.01	8.79
CHA-1	9/10/2014 12:30	24.5	91	6.51	4.78	MICR-1	9/10/2014 14:26	27.48	131	7.94	8.79
CHA-1	9/10/2014 12:45	24.65	92	6.51	4.8	MICR-1	9/10/2014 14:41	27.52	131	7.96	8.85
CHA-1	9/10/2014 13:00	24.6	92	6.51	4.82	MICR-1	9/10/2014 14:56	27.8	130	7.95	8.75
CHA-1	9/10/2014 13:15	24.47	92	6.51	4.86	MICR-1	9/10/2014 15:11	27.86	129	7.91	8.67
CHA-1	9/10/2014 13:30	24.61	92	6.51	4.82	MICR-1	9/10/2014 15:26	27.94	129	7.93	8.71
CHA-1	9/10/2014 13:45	24.89	92	6.53	4.86	MICR-1	9/10/2014 15:41	27.89	129	7.93	8.66
CHA-1	9/10/2014 14:00	24.84	92	6.52	4.86	MICR-1	9/10/2014 15:56	27.81	129	7.96	8.69
CHA-1	9/10/2014 14:15	24.92	92	6.52	4.89	MICR-1	9/10/2014 16:11	27.83	129	7.97	8.7
CHA-1	9/10/2014 14:30	25	92	6.53	4.92	MICR-1	9/10/2014 16:26	27.86	128	7.98	8.62
CHA-1	9/10/2014 14:45	25.02	92	6.53	4.92	MICR-1	9/10/2014 16:41	27.87	129	7.98	8.6
CHA-1	9/10/2014 15:00	24.91	93	6.52	4.93	MICR-1	9/10/2014 16:56	27.88	130	8.02	8.75
CHA-1	9/10/2014 15:15	24.9	94	6.52	4.95	MICR-1	9/10/2014 17:11	27.89	131	8.04	8.71
CHA-1	9/10/2014 15:30	24.89	95	6.52	4.98	MICR-1	9/10/2014 17:26	27.9	130	8.02	8.63
CHA-1	9/10/2014 15:45	24.85	96	6.51	5.03	MICR-1	9/10/2014 17:41	27.89	130	7.98	8.5
CHA-1	9/10/2014 16:00	24.84	96	6.51	5	MICR-1	9/10/2014 17:56	27.94	129	7.98	8.53
CHA-1	9/10/2014 16:15	24.77	98	6.5	5	MICR-1	9/10/2014 18:11	28.03	129	7.97	8.46
CHA-1	9/10/2014 16:30	24.8	98	6.5	5.03	MICR-1	9/10/2014 18:26	28	130	8	8.37

Station ID	Date and Time	Temp °C	SpCond uS/com	pH	DO mgL	Station ID	Date and Time	Temp °C	SpCond uS/com	pH	DO mgL
CHA-1	9/10/2014 16:45	24.83	99	6.5	5.07	MICR-1	9/10/2014 18:41	27.93	131	8.02	8.44
CHA-1	9/10/2014 17:00	24.82	99	6.5	5.06	MICR-1	9/10/2014 18:56	27.92	131	8.01	8.44
CHA-1	9/10/2014 17:15	24.84	100	6.5	5.07	MICR-1	9/10/2014 19:11	27.91	131	7.99	8.26
CHA-1	9/10/2014 17:30	24.81	100	6.49	5.06	MICR-1	9/10/2014 19:26	27.94	130	7.96	8.24
CHA-1	9/10/2014 17:45	24.82	101	6.49	5.14	MICR-1	9/10/2014 19:41	27.95	130	7.92	8.13
CHA-1	9/10/2014 18:00	24.82	101	6.49	5.12	MICR-1	9/10/2014 19:56	27.96	130	7.91	8.11
CHA-1	9/10/2014 18:15	24.81	101	6.48	5.11	MICR-1	9/10/2014 20:11	27.94	130	7.9	8.01
CHA-1	9/10/2014 18:30	24.81	102	6.48	5.13	MICR-1	9/10/2014 20:26	27.92	130	7.89	7.97
CHA-1	9/10/2014 18:45	24.79	102	6.48	5.13	MICR-1	9/10/2014 20:41	27.47	131	7.86	7.89
CHA-1	9/10/2014 19:00	24.78	102	6.48	5.13	MICR-1	9/10/2014 20:56	26.89	134	7.72	7.43
CHA-1	9/10/2014 19:15	24.76	102	6.48	5.15	MICR-1	9/10/2014 21:11	26.57	135	7.63	7.13
CHA-1	9/10/2014 19:30	24.74	102	6.48	5.08	MICR-1	9/10/2014 21:26	26.39	135	7.57	6.9
CHA-1	9/10/2014 19:45	24.73	102	6.47	5.13	MICR-1	9/10/2014 21:41	26.29	136	7.52	6.69
CHA-1	9/10/2014 20:00	24.7	102	6.48	5.09	MICR-1	9/10/2014 21:56	26.21	136	7.45	6.35
CHA-1	9/10/2014 20:15	24.69	102	6.48	5.1	MICR-1	9/10/2014 22:11	26.14	138	7.38	6.03
CHA-1	9/10/2014 20:30	24.68	102	6.48	5.1	MICR-1	9/10/2014 22:26	25.98	138	7.34	5.96
CHA-1	9/10/2014 20:45	24.67	102	6.48	5.09	MICR-1	9/10/2014 22:41	25.9	138	7.33	6.04
CHA-1	9/10/2014 21:00	24.65	102	6.48	5.12	MICR-1	9/10/2014 22:56	25.84	140	7.35	6.17
CHA-1	9/10/2014 21:15	24.64	101	6.48	5.07	MICR-1	9/10/2014 23:11	25.77	139	7.36	6.28
CHA-1	9/10/2014 21:30	24.63	101	6.48	5.11	MICR-1	9/10/2014 23:26	25.71	138	7.37	6.38
CHA-1	9/10/2014 21:45	24.61	101	6.49	5.13	MICR-1	9/10/2014 23:41	25.65	138	7.38	6.42
CHA-1	9/10/2014 22:00	24.58	101	6.49	5.17	MICR-1	9/10/2014 23:56	25.6	138	7.38	6.46
CHA-1	9/10/2014 22:15	24.57	101	6.49	5.16	MICR-1	9/11/2014 0:11	25.55	138	7.38	6.43
CHA-1	9/10/2014 22:30	24.55	101	6.49	5.17	MICR-1	9/11/2014 0:26	25.5	138	7.38	6.48
CHA-1	9/10/2014 22:45	24.53	101	6.49	5.16	MICR-1	9/11/2014 0:41	25.46	138	7.38	6.47
CHA-1	9/10/2014 23:00	24.51	101	6.49	5.2	MICR-1	9/11/2014 0:56	25.42	138	7.38	6.51
CHA-1	9/10/2014 23:15	24.49	101	6.49	5.2	MICR-1	9/11/2014 1:11	25.39	137	7.39	6.56

Station ID	Date and Time	Temp °C	SpCond uS/com	pH	DO mgL	Station ID	Date and Time	Temp °C	SpCond uS/com	pH	DO mgL
CHA-1	9/10/2014 23:30	24.48	101	6.49	5.19	MICR-1	9/11/2014 1:26	25.36	138	7.39	6.55
CHA-1	9/10/2014 23:45	24.46	101	6.49	5.18	MICR-1	9/11/2014 1:41	25.35	138	7.39	6.53
CHA-1	9/11/2014 0:00	24.44	101	6.49	5.16	MICR-1	9/11/2014 1:56	25.32	138	7.39	6.55
CHA-1	9/11/2014 0:15	24.41	101	6.49	5.18	MICR-1	9/11/2014 2:11	25.29	138	7.39	6.59
CHA-1	9/11/2014 0:30	24.4	101	6.49	5.18	MICR-1	9/11/2014 2:26	25.24	138	7.39	6.61
CHA-1	9/11/2014 0:45	24.37	101	6.49	5.18	MICR-1	9/11/2014 2:41	25.22	138	7.4	6.67
CHA-1	9/11/2014 1:00	24.36	101	6.49	5.18	MICR-1	9/11/2014 2:56	25.19	137	7.41	6.73
CHA-1	9/11/2014 1:15	24.36	101	6.49	5.15	MICR-1	9/11/2014 3:11	25.15	137	7.41	6.69
CHA-1	9/11/2014 1:30	24.34	101	6.49	5.16	MICR-1	9/11/2014 3:26	25.12	137	7.41	6.73
CHA-1	9/11/2014 1:45	24.31	101	6.49	5.2	MICR-1	9/11/2014 3:41	25.09	137	7.41	6.8
CHA-1	9/11/2014 2:00	24.3	101	6.49	5.21	MICR-1	9/11/2014 3:56	25.05	137	7.41	6.74
CHA-1	9/11/2014 2:15	24.28	101	6.49	5.23	MICR-1	9/11/2014 4:11	25.01	137	7.41	6.71
CHA-1	9/11/2014 2:30	24.26	101	6.5	5.23	MICR-1	9/11/2014 4:26	24.98	137	7.41	6.69
CHA-1	9/11/2014 2:45	24.24	101	6.5	5.28	MICR-1	9/11/2014 4:41	24.94	137	7.4	6.68
CHA-1	9/11/2014 3:00	24.22	101	6.5	5.26	MICR-1	9/11/2014 4:56	24.91	138	7.4	6.69
CHA-1	9/11/2014 3:15	24.19	102	6.5	5.25	MICR-1	9/11/2014 5:11	24.88	138	7.39	6.64
CHA-1	9/11/2014 3:30	24.17	102	6.49	5.28	MICR-1	9/11/2014 5:26	24.84	137	7.39	6.67
CHA-1	9/11/2014 3:45	24.16	102	6.5	5.26	MICR-1	9/11/2014 5:41	24.81	138	7.4	6.7
CHA-1	9/11/2014 4:00	24.14	102	6.5	5.29	MICR-1	9/11/2014 5:56	24.78	137	7.4	6.67
CHA-1	9/11/2014 4:15	24.12	102	6.49	5.3	MICR-1	9/11/2014 6:11	24.74	137	7.4	6.72
CHA-1	9/11/2014 4:30	24.11	102	6.49	5.29	MICR-1	9/11/2014 6:26	24.72	137	7.41	6.76
CHA-1	9/11/2014 4:45	24.09	102	6.49	5.27	MICR-1	9/11/2014 6:41	24.69	138	7.4	6.75
CHA-1	9/11/2014 5:00	24.08	102	6.49	5.27	MICR-1	9/11/2014 6:56	24.67	138	7.39	6.75
CHA-1	9/11/2014 5:15	24.04	102	6.49	5.25	MICR-1	9/11/2014 7:11	24.65	138	7.4	6.77
CHA-1	9/11/2014 5:30	24.03	102	6.48	5.22	MICR-1	9/11/2014 7:26	24.64	138	7.4	6.82
CHA-1	9/11/2014 5:45	24.02	102	6.48	5.15	MICR-1	9/11/2014 7:41	24.63	138	7.42	6.91
CHA-1	9/11/2014 6:00	24	101	6.48	5.13	MICR-1	9/11/2014 7:56	24.64	138	7.43	6.96

Station ID	Date and Time	Temp °C	SpCond uS/com	pH	DO mgL	Station ID	Date and Time	Temp °C	SpCond uS/com	pH	DO mgL
CHA-1	9/11/2014 6:15	23.97	101	6.48	5.12	MICR-1	9/11/2014 8:11	24.65	138	7.45	7.09
CHA-1	9/11/2014 6:30	23.96	101	6.47	5.11	MICR-1	9/11/2014 8:26	24.68	138	7.47	7.15
CHA-1	9/11/2014 6:45	23.95	101	6.48	5.07	MICR-1	9/11/2014 8:41	24.75	138	7.48	7.27
CHA-1	9/11/2014 7:00	23.93	101	6.48	5.05	MICR-1	9/11/2014 8:56	24.85	138	7.51	7.41
CHA-1	9/11/2014 7:15	23.94	101	6.48	4.98	MICR-1	9/11/2014 9:11	25	138	7.53	7.51
CHA-1	9/11/2014 7:30	23.95	101	6.47	5	MICR-1	9/11/2014 9:26	25.16	138	7.54	7.61
CHA-1	9/11/2014 7:45	23.96	100	6.48	4.93	MICR-1	9/11/2014 9:41	25.39	138	7.56	7.72
CHA-1	9/11/2014 8:00	23.98	100	6.48	4.92	MICR-1	9/11/2014 9:56	25.64	137	7.6	7.9
						MICR-1	9/11/2014 10:11	25.64	137	7.69	8.07

Appendix E

Station Pictures

MICL-3

8/05/2013

Upstream



MICL-3

8/05/2013

Downstream



MICL-2 8/05/2013 Upstream



MICL-2 8/05/2013 Downstream



CHA-1 09/16/2014 Upstream



CHA-1 09/16/2014 Downstream



MICR-4 8/05/2013 Upstream



MICR-4 8/05/2013 Downstream



MICR-1 9/16/2014 Upstream



MICR-1 9/16/2014 Downstream

